BRIEFER ARTICLES

THE INFLUENCE OF ETHER ON THE GROWTH OF ENDOTHIA

The writers found it necessary to conduct a series of experiments on the influence of ether on the growth of *Endothia*, preliminary to more extensive studies on the influence of the tannin content of the host plant on *Endothia parasitica* and related species. Owing to a change in plans this phase of the work was abandoned. However, it has been considered advisable to publish the results of these experiments.

The medium used was as follows: water 1000 cc., glucose 20 gm., peptone 10 gm., potassium phosphate (dibasic) 0.25 gm., magnesium sulphate 0.25 gm. The organisms used were *Endothia parasitica*, *E. radicalis* (American and European strains), including one from *Quercus alba* which was sent to us by Dr. GEORGE P. CLINTON. This last organism was a much slower grower than the others. In order to prevent the evaporation of the ether, the cotton plugs were pushed a short distance into the tubes and close-fitting corks inserted.

In the first experiments, approximately 10 cc. of the medium was placed in each tube and two or three drops of ether added by means of a graduated pipette (that is, not more than 0.1 cc.). These tubes were then inoculated with the organisms. In all cases the checks grew more slowly than those to which the ether had been added. These results made it necessary to conduct a more careful series of experiments, in which definite but varying amounts of the ether should be used.

In this second experiment, 0.1 cc. ether was added to certain tubes of the medium and 0.4 cc. to others. These were inoculated and kept as above. The results confirmed the first experiments, but made it necessary to conduct a still more extensive experiment.

This experiment was as follows. To 10 cc. of culture solution, ether was added in quantities of 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, and 1 per cent. In this experiment only one species was used, *E. parasitica*. On the third day the check showed a good normal growth; that having 0.05 per cent ether was somewhat accelerated and that having 0.1 per cent was noticeably so. The next two members of the series showed slight germination. The next day but little change was

noticeable except that germination was apparent up to and including the tubes containing 0.6 per cent ether. The second day the culture containing 0.3, 0.4, and 0.5 cc. ether showed accelerated growth, while the one with 0.6 per cent showed good growth. On the tenth day after inoculation, the cultures with the higher percentages of ether showed signs of more vigorous growth, except the two highest members of the series, which never germinated. From this time on the results do not agree in all details with the earlier stages of the experiment, owing to the unavoidable escape of varying amounts of ether from the different tubes and the consequent change of percentages. Therefore, it was not practicable to keep these cultures containing ether under observation for more than ten days or two weeks, a time too short for pycnidial formation in liquid media.

These results are represented in the accompanying table, in which the check is rated 5, and the acceleration of retardation computed on this basis.

TABLE I

GROWTH OF *Endothia parasitica* IN LIQUID MEDIA TO WHICH THE INDICATED AMOUNTS OF ETHER WERE ADDED (AMOUNT IN CC.)

Days after inoculation	0.0	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
3.....	5	7	9	2	1	0	0	0	0	0	0	0
4.....	5	7	9	4	3	2	1	2	0	0	0	0
5.....	5	5	6	5	4	4	3	3	0	0	0	0
6.....	5	5	6	5	5	5	4	3	0	0	0	0
7.....	5	6	7	6	5	5	4	3	1	0	0	0
8.....	5	6	6	6	5	5	4	3	2	1	0	0
10.....	5	7	6	6	5	5	4	3	2	3	0	0

It appears that small quantities of ether have a stimulating effect on the fungus, quantities of from 0.2 per cent up retard germination, and quantities from 0.4 per cent up have injurious effect on the growth of the fungus. While it is possible to grow the mycelium under the influence of ether, the volatile nature of this chemical makes it impossible to keep such cultures intact long enough for pycnospores to appear. After two to two and one-half weeks the mycelium showed signs of dying and pulling away from the glass in the cultures containing the higher percentages of ether.—MELVILLE T. COOK and GUY W. WILSON, *Rutgers College and New Jersey Agricultural Experiment Station, New Brunswick, N.J.*